THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

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TAMED INVENTIONS

By Dr. Edwin E. Slosson.

Coming inventions cast their shadows before. Some of the most useful of the gifts of science were first revealed to mankind in a malevolent rather than a benevolent aspect. But even the most destructive agencies may in the course of time be brought into the constructive service of the human race. As the wolf was tamed into the faithful dog and the wild elephant converted into a beast of burden so man may tame the engines of war and extract medicaments from the most baneful drugs.

Steel, man's most useful metal, made its appearance in the form of swords and spearheads for the killing of man. Now we employ it for the skeleton of skyscrapers and steamships.

Petroleum was first employed as "Greek fire" for setting ships on fire. Now it is employed as fuel for the propulsion of ships.

The horse was employed upon the field of battle long before he was put to work upon the harvest field. He was first hitched to a war chariot and only later was he set to the humble and useful task of pulling a plow. Judging by the Egyptian and Assyrian inscriptions the Chariot was the first wheeled vehicle, but this developed in the course of centuries into the cart, the carriage, and the car.

The most efficient of the ancient road builders, more efficient indeed than most modern peoples, were the Romans, and their famous system of highways, connecting the frontiers of the empire with the forum of the capital, was designed for armies, not agriculturists.

It has often happened in history that what was designed to kill is retained to cure. Many of our modern medicines were employed by savages for poisoning their arrow points. Strychnine and aconite had this ill omened origin. Another arrow poison, obtained by the savages from cassava juice, is hydrocyanic acid, which in the hands of the modern metallurgist extracts nine-tenths of the gold supply of the world.

Arsenic, which during the Renaissance was the fashionable means of poisoning people, is now used for the more laudable purpose of poisoning plant pests and the parasites of man.

Distilled alcohol, introduced by the alchemists under the misleading name of the "elixir of life", has done untold harm to the race. Yet when our gasoline supply runs short, alcohol may prove to be our main reliance for autos and airplanes. Once the world stops drinking it we will have alcohol to burn.

We owe our wireless to the late war, and the art of aviation, which played an important part in that conflict, has not yet found a place of importance in civil life.

Government itself is a war baby, born from the need of unified control in time of danger. The earliest rulers were the chiefs who defended their folk against attack or led them on predatory raids against their neighbors for the procurement of booty, especially women and children.

Government, once started as a war measure in emergencies, proved useful for the maintenance of order and the promotion of the general welfare, and hence came to be regarded as indispensable to civilization. But war remains the principal function of government even in the most peaceable of nations. Our own federal government in 1920 spent 93 per cent of its revenues on wars, past, present, and future, while devoting one per cent to scientific research and developmental work.

Never before has the world seen such feverish activity in scientific investigation and invention as during the Great War, never such liberal governmental support; never such enterprise and self-sacrifice on the part of the citizens. And so it has often been in the past. Mars has always been able to enlist the energies of man with more success than Minerva or the Muses. Shaw, who sometimes assumes the role of the devil's disciple, has in his "Man and Superman" put into the mouth of Mephistopheles a caustic comment on war as a stimulus to man's inventive powers.

> "I have examined Man's wonderful inventions. And I tell you that in the arts of life man invents nothing; but in the arts of death he outdoes Nature herself, and produces by chemistry and machinery all the slaughter of plague, pestilence and famine. The peasant I tempt today eats and drinks what was eaten and drunk by the peasants of ten thousand years ago; and the house he lives in has not altered as much in a thousand centuries as the fashion of a lady's bonnet in a score of weeks. But when he goes out to slay, he carries a marvel of mechanism that lets loose at the touch of his finger all the hidden molecular energies, and leaves the javelin, the arrow, the blowpipe of his fathers far behind. In the arts of peace Man is a bungler. I have seen his cotton factories and the like, with machinery that a greedy dog could have invented if it had wanted money instead of food. I know his clumsy typewriters and bungling locomotives and tedious bicycles; they aretoys compared to the Maxim gun, the submarine torpedo boat. There is nothing in Man's industrial machinery but his greed and sloth; his heart is in his weapons."

But, as we have seen, the bright ideas that have been struck out of man's brain in the clash of conflict may persist to enlighten the race. "God hath made man upright but they have sought out many inventions" for the purpose of doing injury to their fellow-men, but often these have, like Balaam's curse, turned out to be blessings. Though we may regret that science should so often

show her sinister side, yet we must agree that civilization does sometimes go forward by riding on a powder-cart.

WOMAN ARCHAEOLOGIST DOES OWN DIGGING

There are few real pick-axe archaeologists among women, but Mrs. Earl Morris has dug for prehistoric remains with her own small hands and has ridden alone into dark, unexplored canons, seeking signs of remote occupation. With her husband, who is an archaeological explorer for the American Museum of Natural History, she recently returned from New Mexico to New York, bringing trophies which students of America's ancient history will admire when they are placed upon exhibition.

"They were really my find, weren't they, Earl," Mrs. Morris demands, pointing to two fine turquoise pendants which are one of the expedition's proudest and most significant discoveries. Mrs. Morris's specialty, however, are Basket Maker sandals, and to the study of these she is now giving most of her time.

The Museum's excavations at the Aztec Ruin, New Mexico, are being conducted chiefly with a view to obtaining light upon the three periods called, respectively, the Basket Makers, the Post Basket Makers's, and the Pre-Pueblo. Although the Basket Makers, who flourished 4000 or more years ago and antedated the Cliff Dwellers by several thousand years, had not learned to fashion pottery, yet they displayed fine craftsmanship in the manufacture of baskets and sandals woven of yucca fibre and ornamented with intricate and beautiful designs whose colors have survived the centuries. All of the specimens in Mrs. Morris's collection are obviously intended to adorn small feet.

It was one hot day last November, when all were digging in dust-masks, that her spade opened the site which was to yield those turquoise pendants. The expedition was feeling rather discouraged. They had found no valuable skulls. And archaeologists are not happy unless they find skulls. Finger -bones don't "get them much forrarder".

"I'm going to try once more," declared Mrs. Morris, and taking her shovel she went down the slope to a spot which the other scientific diggers had abandoned. Soon the earth crumbled. Thrusting in her hand she touched bones. "And you cannot imagine the thrill of discovering that there were not one but three skulls!" She had come upon a prehistoric cemetery, but a great fire at some period had destroyed baskets and textiles, leaving only bones. The Canon del Muerto, where this exciting event took place, is a hundred miles from a railroad, in the northeastern corner of New Mexico.

Under the devastated cemetery lay two skeletons, upon their breasts the turquoise ornaments. These are the earliest examples of turquoise mosaic that have been found in our Southwest, and are easily 2,000 years old. They were the burial adornments of an old woman and a young man of the Basket Maker people, and are made of bits of turquoise and abalone set in wood.

"You can see from remains which that dry climate has almost mummified that the Basket Maker ladies wore bobbed hair," Mrs. Morris points out.

Between her archaeological excavations she explored many dark side canons leading off from the main canon, and in some of these, ancient paintings were still quite fresh upon the walls. Less appealing were the fresh bear-tracks.

Mrs. Morris was instructed at the American School for Prehistoric Study in Paris. The students every summer continue investigations at the La Quina station in southern France, where fossils from 50,000 to 100,000 years old are frequently unearthed.

"Some of those caves in the Pyrenees are two miles long. They open into the hillside and slope down into darkness. The walls are covered with beautiful paintings and carvings. You have to wriggle for long distances on your stomach to explore those caverns, but we thought nothing of that," said Mrs. Morris, who was therefore not dismayed by the caves of Dead Man's Canon.

CORN GROWN IN 70 DAYS; EARS BURIED IN GROUND

Corn with stalks so short that the ears appear to grow directly out of the ground and maturing in 70 days is now being grown at experiment stations under the direction of the U. S. Department of Agriculture. In an effort to produce corn of short growing season and high resistance to cold, this corn will be bred with new varieties discovered in the Andean highlands of South America by Fred D. Ritchey of the Bureau of Cereal Investigations and who has just returned to Washington. This South American corn matures in a climate 20 degrees colder than that of the "corn belt".

"Corn with such short stalks is now being grown that the northern farmer may before long be harvesting his corn crop with a potato digger," said Dr. E. D. Ball, director of scientific work of the Department of Agriculture to a Science Service reporter. "Last summer I saw at the experiment station at Akron, Colorado, corn with stalks lessthan two feet tall when mature. The ears were so close to the ground that after hilling up they were nearly completely buried and appeared as if they were sprouting up through the ground directly from the roots. This corn matured in about 70 days."

These short season corns are not the result of cross-breeding by Department experts but are discoveries of varieties which have been grown in isolated sections in the northern parts of the continent. One of them has a rather eventful history. It was brought to Manitoba by Ruthenian immigrants a number of years ago from their native country on the slopes of the Carpathian mountains where the season is short. They have cultivated it in their colony 250 miles northwest of Winnipeg for years and have evolved a distinct variety. Others of even shorter season have been found in New Brunswick, Nova Scotia, and other northern sections.

In Bolivia and Peru, Mr. Ritchey found corn maturing in spite of the fact that the average temperature for the year was 50 degrees Fahrenheit, while the average minimum temperature during the growing season was as low as 39 degrees. In our corn belt, an average night minimum of 55 degrees is considered the limit for commercial production and the average temperature during the growing season is about 72 degrees.

Few varieties of corn raised commercially in this country mature in less than 120 days although some can be grown in 90. In the South, 160 to 180 days is the rule. It is the hope of the Department through the crossing of these South American varieties with those from the far north to obtain a short season corn, highly resistant to low temperatures. If the results are successful the product will probably be a dwarf variety, and the potato digger may come in handy when harvest time comes.

VENUS NOW MOST BRILLIANT

By Isabel M. Lewis
U.S. Naval Observatory

The planet Venus, which has been such a magnificent object in the western sky during the past winter and spring, far surpassing in splendor the other planets and brightest stars, will reach her greatest brilliancy on May 24. A few weeks later she will be so close to the sun that it will be impossible to find her in the twilight haze after sunset and on July 1 she will be in inferior conjunction with the sun and pass between earth and sun. After that she will be in the morning sky and late in July the early riser will find her ready to greet him before sunrise. At the end of the first week in August Venus will again be at her greatest brilliancy and after that will draw farther away from the sun and gradually decrease in brightness as she recedes from the earth.

About a month ago, in the latter part of April, Venus was at her greatest distance from the sun in the western sky, at greatest eastern elongation as it is called. She was then setting more than three hours after sunset and viewed in the telescope she looked like a little half-moon. After that date she began to draw in gradually toward the sun on the side of her orbit nearest the earth and began to resemble the crescent moon in the telescope. When Venus reaches her greatest brilliancy on the 24th of this month she will look like the crescent moon at the age of five days. This crescent will gradually grow thinner until at inferior conjuction on the first of July it will disappear and the planer will be invisible even in the telescope.

It may seem strange that Venus should be at her greatest brilliancy when she shows the crescent phase instead of at eastern elongation when half her surface is illuminated and she resembles the half-moon or earlier when she looks like the gibbous moon in the telescope. It must be remembered, though, that Venus is much nearer to us and so appears larger when the illuminated portion is crescent-shaped. As a result this crescent is greater in area than the half moon or gibbous moon of eastern elongation and earlier which we see when the planet is farther from the earth. As the brightness of Venus is proportional to the area of the illuminated part of its surface its brightness will be greatest when the planet is in the crescent phase. Butthis crescent inscreases in size while it narrows in width as Venus draws in toward the sun and it is a nice problem in mathematics to determine just when the area of the crescent is a maximum and when as a result the brilliancy of the planet is greatest. It has been found that this always happens 36 days before and after inferior conjunction.

As Venus will be in line with earth and sun at inferior conjunction on July 1 you can figure it out for yourself that Venus will be most brilliant on May 24 when she is visible in the west after sunset and on August 6 when she will be

found in the east before sunrise. At and near the time of greatest brilliancy Venus may be easily seen in broad daylight and also like the moon she casts a strong shadow.

BRICKS FROM PRESSED DIRT USED IN EUROPE

A compressed brick made from ordinary dirt and suitable for house construction has been developed by two French engineers working under the auspices of the National Committee for Scientific Research and Invention.

In the process perfected by MM. Waligorsky and Carriere, ordinary subsoil earth containing five to eight per cent of clay is compressed by tremendous pressure. The resultant bricks have a pressure resistance of 600 pounds per square inch.

Walls are coated with a protective mixture which makes them impervious to moisture. The Committee states that the new bricks are only recommended for low buildings. Their chief value will be on the farm where outbuildings and walls can now be built with materials found on the premises.

The committee is trying to duplicate the results obtained by a German engineer named Hecht who uses a mixture of other ingredients. To greasy, slippery earth is added either foundry waste, coke ashes or other cheap porous substances. Pine needles are kneaded into the mixture which is placed in moulds, compressed by hand and allowed to dry in the open air. The bricks formed are considerably larger than the ordinary variety, thus reducing the labor of brick-laying.

Two workers and an assistant working at Gross-Lichterfeld are able to make 200 to 225 bricks in an eight-hour day, equivalent to 1?00 bricks of the ordinary size.

Once they are dry these blocks are sufficiently hard to be laid the same as other bricks. A special mortar has been prepared. Laboratory tests show a resistance of 64 pounds per square inch for blocks four weeks old. Age makes them more resistant. Outside walls are made 9 to 12 inches thick, inside separating walls only 5 inches. Only one-story buildings are constructed but they are dry, warm in winter and cool in summer.

BIG GROUP OF SUN SPOTS MAY BE SEEN

A group of sunspots, visible under good conditions with the naked eye, and easily seen through field glasses of moderate power, is now travelling across the sun's face. The group is the largest seen in several weeks. It consists of four separate spots with a few dark streaks between and has been growing in size for several days. The spots were in almost the middle of the sun's face on May 15, somewhat south of the solar equator. They will disappear around the edge of the orb about May 22 but because of foreshortening will be hard to see for a few days before that time.

Persons trying to see this group of spots should always use heavily smoked or colored glass when looking at the sun. If field glasses are used the smoked glass should be placed between the glass and the sun.

SOUTH AMERICAN DRINK CAUSES DESIRE TO DANCE

Marathon dancers or those who want to be fresh at three o'clock in the morning after having danced the whole night through, should investigate the properties of a new drink reported to be popular in the backwoods section of the Republic of Colombia and described by Dr. H. H. Rusby of the New York College of Pharmacy. It makes the natives of Colombia want to fight but its effect on more sophisticated white man is to make them want to dance.

At least that was the effect on Mr. Gordon MacCreagh, who personally investigated the matter. The drink is an infusion of parts of a woody plant called Caapi and is taken by the natives when they want to make themselves indifferent to fatigue or danger. The first effect is a driving of the blood toward the heart and internal organs. The drinker becomes pale and anxious, stands up restlessly and may be seized with convulsive tremors. This effect is only transitory and then the subject becomes flushed and excited. Fear or even ordinary caution are forgotten and impelled by a desire for muscular activity he rushed about looking for trouble of any sort. This condition lasts for hours and is followed by a period of weariness and sleepy relaxation.

Analysis of the drug is difficult and indicates its active principles to be a number of alkaloids similar to those found in nux vomica and which cause somewhat similar physiological effects.

VACUUM CLEANERS DRAW SECRETS FROM CRIMINALS

Microscopic examination of the dirt and dust upon the clothing of suspects is a new application of science whereby the French police are catching criminals.

After cross-examination, the suspects are stripped of their clothing whose superficial dust is first examined under a strong microscope. A vacuum cleaner is next applied to draw out other dirt into a pan. In some instances a more thorough process in which heating figures isused to separate all particles of foreign matter.

From the dirt thus secured the detectives determine whether the suspect has been telling the truth. One murderer tried to prove an alibi by saying that he had slept in an open field the night of the crime. Microscopic examination of his clothing showed he ahd slept in a quarry.

An unsuspected carpenter was connected with a murder by means of saw dust found on a piece of overall which the victim had torn from his assailant and which was found at the scene of the crime.

The chief value of the new plan has been in breaking down the bravado of criminals. They frequently confess when shown that their firststories were lies.

Forty thousand rats, capable of doing $80,000 damage in a year, were recently killed in Monmouth County, N. J. at a cost of seven-tenths of a cent for each rat.

HEALTH AND "PEP" NOT MUCH RELATED

Health is not necessary for good nature in children, declares Dr. Karl Pearson as the result of a study of about 2000 boys and 2000 girls in English schools. Neither is health or the lack of it always or even frequently associated with vivacity, popularity, or conscientiousness. There was found to be little relation between health and general intelligence.

Athletic prowess went with good health as did self-assertiveness; but the old idea that delicate children take to intellectual work and are particularly shy and conscientious was not confirmed, nor was the similar one that lively boys are likely to neglect studies for physical sports.

Blonds were found to be slightly less healthy than brunettes.

Dr. Pearson's results, it is asserted, seem to shatter widely held beliefs. They indicate that it is not possible for teachers to modify general intelligence or psychic characters which seem to be unchanged throughout the whole of school life; that general health changes little during the school period; and that health is not a governing factor of temperament. Health was found to be associated to only a slight extent with qualities of character, and with temper practically not at all.

Babies depend more on their heredity for good health than upon what station of life they are born into or what care they get, concludes Professor Pearson as the result of a similar statistical study of 1600 babies from a large manufacturing town. The poor health of those not breast-fed is stated to be chiefly due to the inheritance of the weakened constitution of a mother not able to nourish her child. Clothing is important, but it is not highly correlated with health and it becomes less important as the child grows older.

The health of the father and mother is most important, and it is stated to have more to do with the health of the child than the wages of the father or the employment of the mother.

MANY BOTTLED WATERS NO BETTER THAN CITY SUPPLY

Water from the tap in any well regulated city is as likely to be healthful and beneficial as many of the well-advertised medicinal waters, J.W. Sale who helps enforce the Federal Pure Food and Drugs Law has reported to the American Chemical Society.

Investigation of one "health spring" showed that most of the persons who drank of its waters for the first time became violently ill, but this was attributed by local physicians to its "strong medicinal action". Further investigation showed that many of the users of the water developed typhoid fever which was traced to the spring. In another case the spring was pure, but the water was dangerously contaminated during its passage through a pipe line to the bottling station.

Since the Federal Law became really effective, many labels on table waters had been considerably toned down, Mr. Sale said. This was true of those alleged to contain lithia and supposed to be of use in rheumatic or gouty conditions.

Mr. Sale said one of these waters contained so little lithia that to get a dose of 7 grains it would be necessary to drink 50,000 gallons of the water.

SIMPLE SCIENCE

BY WOW

PAPER

One should know something about writing paper because one's social position depends so much upon the grade of paper one uses. The ancients used to write on stones. The strongest men probably used heavy stones as a sign of their high rank. Instead of posting letters as we do now they used to throw them. Their love letters probably had more effect in those days than many of ours do.

Paper is quite an old commodity, although the English have used it only since the fourteenth century. Hornets have used it always. They bite off bits of wood and chew it until it turnes into paper, and then make their nests of it. They get so cross when you go near their nest that they must be very fond of their paper, like men in the street car when ladies are standing. If people would chew wood instead of tobacco and gum, newspapers might be cheaper, and sidewalks cleaner.

Paper is usually made by chewing the wood with machinery, and soaking it in chemical saliva, which dissolves out the impurities and leaves a nice tough fibrous material called cellulose. The chemical saliva usually consists of either alkali, or acid bisulphite of lime. Cellulose occurs in all vegetable matter but not in animal matter. If you are in doubt what kingdom a thing or person belongs to you can tell by looking for cellulose. It's also a half brother to starch and a first cousin to sugar. It's like a good many relatives - lacks sweetness, is tough and lazy. It's used for making guncotton, paper, clothes, etc.

The cellulose is next sized by being soaked in water, alum, gypsum, resin soap, etc. It is next spread out in a thin layer on a wire screen belt and passed over rollers which squeeze it into long sheets of paper.

Rags make very good paper because the cellulose fibers in rags are long and tough. A friend of mine wears his suits ten years. His rags should make excellent paper.

Newspapers are hard on cellulose. Newsboys "sell you those" also. It's nice to know how paper is made so one can talk about it at afternoon teas.

STRAWBERRIES

The cultivated strawberries now grown in Europe and America owe their size to ancestors in Chili. Up to 1714, large fruited strawberries were not known in Europe; the native berries being small but of good flavor. In that year, a

Frechman brought plants from Chili. These were crossed with the native sorts and with the Virginian strawberry introduced into Europe early in the previous century. By this crossing, plants were developed which combined large size with delicate flavor.

TABLOID BOOK REVIEW

"THE STORY OF BAKELITE" by John Kimberley Mumford. New York, Robert L. Stittson Co., 461 Eighth Avenue.

This is advertising literature at its best, artistic, interesting, instructive, and authentic. A good book to get for the laboratory library for it tells all about a type of artificial resins that have come into common use and yet may not be mentioned in the textbook.

AMERICA'S CHEMICAL CENTER

What place in America is famous for its petroleum refining? Not Texas or California, famous for oil, but New York City and its environs. A survey by the Committee on Regional Plan of New York and Its Environs shows that the output of refineries in the vicinity of New York represents one-fifth of the petroleum wealth of the entire country. It was also found that a region containing one-tenth of the population of the country is producing one-fifth of the chemical output of the United States. The chemical industry is centered in New York. Yet Manhattan and Brooklyn, New York proper, is rapidly becoming an odorless city, the chemical industry is deserting that part of New York for the open country and cheaper land.

NATURE'S CROSSES

Many may be shocked to learn that President Roosevelt used to wear a cross on his watch chain. It was in one of those lucky stones which are often plowed up in the fields or found on the surface of the ground after a rain storm in some parts of Virginia and Georgia. These stones are in reality double crystals of the mineral staurolite, a somewhat uncommon silicate, that are so placed with respect to each other that their prominent edges form a true cross. These crystalline crosses are just one of the mysteries of Nature's laboratory.

The appetites of hogs and cattle do not grow less as they grow older but ability to put on flesh does decrease.

There are practically no negro children in Mississippi who are blind as the results of preventable infection at birth, the surprising results of a recent health survey show.